ZIN Technologies

Feb. Financial Review

March 18, 2013

NASA GRC SpaceDOC

NASA GRC SpaceDOC

101 Fluids and Combustion Facility, MIP & TSC

ZIN Manager: **Michael Johanson**
ZIN Engineering Lead: M.O'Toole
ZIN Operations Lead: T. Wasserbauer
ZIN Integration Lead: C. Rogers

NASA Program Manager: Tom St'Onge
NASA Project Manager: Bob Corban (Kevin McPherson)

SpaceDOC 101 encompasses the International Space Station (ISS) Fluids and Combustion Facility (FCF) Project and its initial payloads, Light Microscopy Module (LMM) and the Multi-user Droplet Combustion Apparatus (MDCA) have been launched and the flight units are installed on the ISS. The Flight units on the ISS, as well as the units on the ground (Ground Integration Units and the Engineering Development Units) need to be operated and maintained. This Delivery Order is for the operation of the FCF racks on orbit and on the ground, resolution of any anomalies, evaluation of trends, software upgrades, hardware obsolescence evaluation, new hardware development to support future capabilities, verification, and training the crew and operators on the hardware/software. Also, as new payloads are developed for the FCF, analytical modeling and engineering analysis of the interface will be required.

The CIR Flight Unit, along with MDCA, was delivered to the ISS by STS-126 (November 2008). The FIR Flight Unit along with the LMM were delivered to the ISS by STS-128 (August 2009).

Issues and Concerns

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA

Issue	Potential Impact	Action Plan	Resolution Date
HRDL/Rack Lock –ups	Loss of HRDL downlink capability	Develop software patch that eliminates HRDLOS disk writes to /sd0. This resolves the root cause of the file allocation table conflict Procedure work-around implemented successfully to allow operations	**March**

Monthly FCF Highlights

- FLEX Science
  - Completed FLEX Science CO@ Diluent Exchange Matrix Matrix
  - Completed and down-linked 29 test ignitions
- ACE Science
  - Completed the FIR/ACE JIT in support of ACE-M-1 ops
  - Performed FIR IOP/FSAP disk maintenance operations in prep for ACE-M-1 ops
  - Draft version of ACE camera upgrade procurement specification
- Safety
  - Initiated CIR Re-certification SDP
  - Review copy of GCIP Fracture Control Summary Report
- Software
  - Released IOP & IPSU software mods to support ISU disk re-format
  - Released LMM Combined Software bundle supporting the ACE-M-1 requirements
- Integration
  - Performed Professor Ferl LMM/Bio experiment feasibility assessment
- Hardware deliverables
  - Completed LCB power supply board assembly
  - Completed LCB PCB board vibe (set 1 of 2)
- IPSU-G
  - Demonstrated 2 camera inputs to disk using IPSU-G development h/w
  - Drafted version of IPSU-G specification

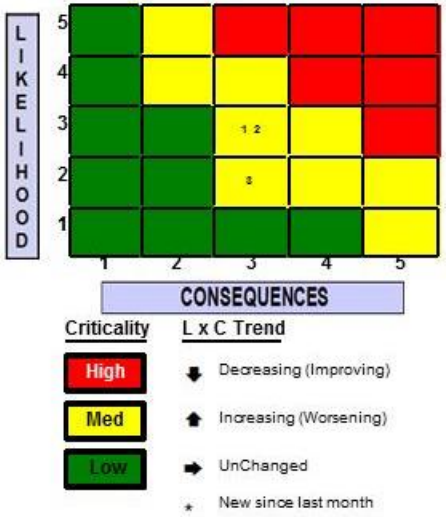
2013 Deliverables List

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA

Deliverable	Planned	Actual	Note
GCIP flight unit	Mar-2013		HTV delivery moved to May 8th
MDCA Avionics Package spare	Apr-2013		Assembly and test completed. Final GIU functional validation planned in March
LMM Control Box spare (No Environmental)	Apr-2013		Out of plan board vibe required. Assembly complete scheduled April
QD Lubrication Kit (if required)	Jul-2013		Concept coordinated with ISS Qdirt. Final design pending program feedback
IPSU spare - Remora	Sep-2012		Assembly complete Vibe planned Mar
MDCA Color Camera spare	Nov-2012		Vibe planned Mar
IPSU Analog repair (SN 2001)	Apr-2013		
WFCA Controller (2)	Oct-2013		
FOMA Re-Circulation Pump	Nov-2013		
EPCU Rack Power Switch	Dec-2013		
IRR GC Filter (3)	May-2013		
IRR Vent Filter (3)	June-2013		
Spare Cables (7)	Sept-2013		
Spare Hoses (4)	July-2013		
GC Manifold Test Unit	Nov-2013		

Risk Matrix - FCF

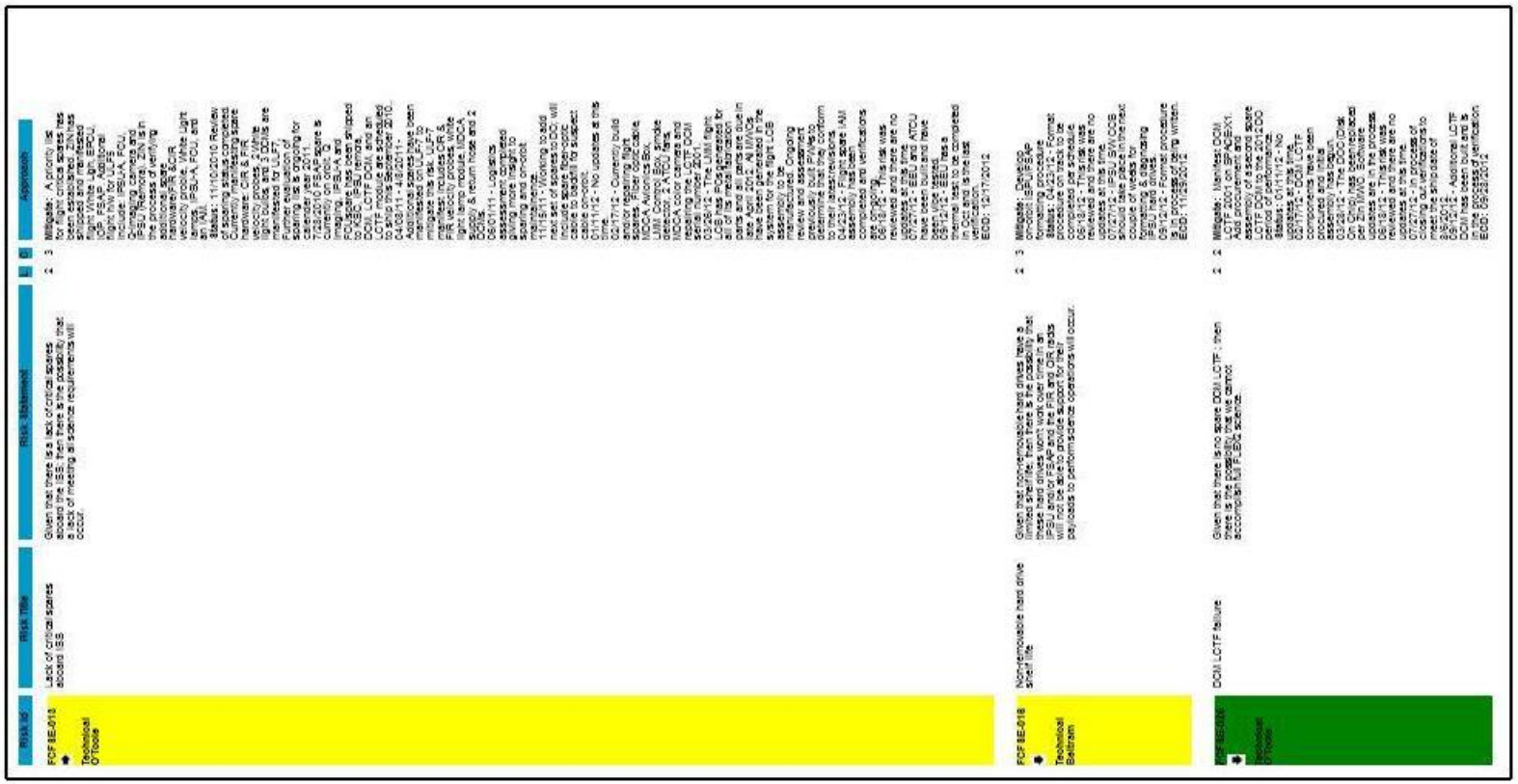
101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



Risk Id	Risk Title	Risk Statement	L	C	Approach
FCFSE-026 ➡ Technical Beltram	LMM GIU does not fully emulate the flight unit	Given that the LMM GIU does not fully emulate the flight unit;; the possibility exists that future LMM flight experiments will not operate correctly.	3	3	**Mitigate:** Plan is to review LMM GIU non-flight design issues, and add task to update LMM GIU to the next DO period of performance. **Status:** 12/21/11 - Task has been added t the DO to upgrade to LMM GIU. 01/11/12 - No updates at this time. 02/17/12 - The LMM GIU has been assessed and the upgrades needed to emulate the flight system have been identified. Additionally, microscope motor functions are in the process of being repaired. 03/28/12 - Risk has been reviewed and there are no changes to its status at this time. 04/23/12 - Currently preparing trouble shoot procedures for LMM motor functions. 06/18/12 - This risk was reviewed and there are no updates at this time. 07/27/12 - Turret motor problem diagnosis has been completed and repair for it is in process. **ECD:** 07/02/2012
FCFSE-029 * Technical O'Toole	ICM failure	Given that the ICM may fail; then there will be a significant impact to the back lit imaging science instrument to occur.	3	3	**Mitigate:** Develop ICM spares. **Status:** **ECD:** 04/30/2013
FCFSE-014 ⬇ Technical Beltram	IOP removable hard drive shelf life	Given that the IOP removable hard drives have a limited shelf life; then there is the possibility that these hard drives won't work over time and the FIR and CIR racks will not be able to provide support for their payloads to perform science operations will occur.	2	3	**Mitigate:** Implement a procedure to re-format the hard drive on-orbit to minimize loss of magnetic field encoding data on the disk. **Status:** 04/23/12 - Currently on track for the development of the formatting procedure. 06/18/12 - This risk was reviewed and there are no updates at this time. 07/27/12 - Formatting being developed. 09/12/12 - Documented format procedure is in process of being developed. **ECD:** 08/30/2013

Risk Matrix - FCF

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



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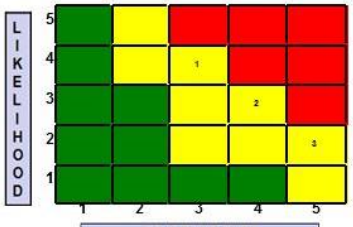
101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



Criticality

High

Med

Low

L x C Trend

Decreasing (Improving)

Increasing (Worsening)

UnChanged

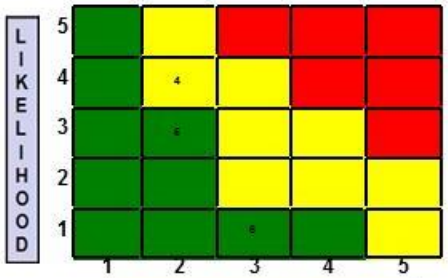
New since last month

Risk Id	Risk Title	Risk Statement	L	C	Approach
MDCA-012 ➡ Technical O'Toole	FLEX-2J Droplet Size Repeatability	Given the tolerance on droplet reproducibility has not been demonstrated there is possibility that we will not meet the reproducibility requirement	4	3	**Mitigate:** Review science requirement with JAXA and determine the capability of the flight hardware to meet the science requirement. **Status:** 06/18/12 - Not started. S/W engineering resource not available as of 6/15/2012. Expected closure date is Aug 31, 2012. 09/12/12 - Awaiting for the revised MDCA S/W to complete the last mitigation task. **ECD:** 10/31/2012
MDCA-011 ➡ Technical O'Toole	FLEX-2J Deployment Validation	Given that we cannot verify multiple droplet deployments in a 1G environment there is possibility that not all science will be met	3	4	**Mitigate:** Develop a robust 1G validation program **Status:** 06/18/12 - Not started. S/W engineering resource not available as of 6/15/20102. 07/27/12 - S/W developer resource got a late start. 09/12/12 - Pusjhed out the first mitigation task by one month per monthly RMWG. **ECD:** 10/31/2012
MDCA-007 ➡ Cost O'Toole	Lack of on-orbit spare avionics box	Given that there is no flight spare MDCA avionics box on ISS and there are no plans or budget to build a flight or GIU MDCA avionics box; then there is the possibility that, if the MDCA avionics box becomes inoperable, a complete loss of the ability to obtain FLEX-2 science will occur.	2	5	**Mitigate:** A plan to build a flight spare avionics package is authorized under the current DO with delivery planned for the 4th quarter of 2011. **Status:** 08/24/11 - Still on schedule to deliver flight spare avionics box. 10/04/11 - The project is still targeting the flight spare avionics delivery in December of 2011. 11/15/11 - Delivery of the assembly is projected for February 1, 2012. Verification and manifest is expected to be included in the follow-on DO period of performance. 03/07/12 - Flightspare MDCA avionics box is in the process of being built per ZIN Tech MWO. 03/28/12 - Flightspare avionics box is tentatively scheduled for several environmental tests as follows: Vibe & EMI in May of 2012 and Thermal Cyale in June of 2012. 04/23/12 - Flightspare avionics box is in the process of being built. 06/18/12 - Assembly complete. Vibration and EMI testing Completed. Thermal Cycle testing scheduled for June 2012. **ECD:** 09/28/2012

NASA GRC SpaceDOC

Risk Matrix - FCF

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



Criticality	L x C Trend
High	Decreasing (Improving)
Med	Increasing (Worsening)
Low	UnChanged
	New since last month

Risk Id	Risk Title	Risk Statement	L	C	Approach
MDCA-013 ➡ Technical O'Toole	FLEX-2J Droplet Imaging Resolution	Given that the there is limited performance data for the droplet imaging camera at 60 frames per second there is possibility that we will not meet the resolution requirement	4	2	**Mitigate:** Review science requirement with JAXA and determine CIR h/w capability. **Status:** 06/18/12 - Resolution test pending 60 fps camera configuration. Initial attempt to operated at 60 fps failed. Expected closure date is Aug 31, 2012 per O'Toole's e-mail Friday 6/15/2012. 09/12/12 - Demonstrated that there is a 60 fps capability. The resolution test still needs to be done. **ECD:** 08/31/2012
MDCA-010 ➡ Schedule O'Toole	FLEX-2J SRD not signed	Given that the FLEX2J SRD is not signed at PDR there is a risk that project cost and schedule will not be met.	3	2	**Mitigate:** Document requirements as understood via previous TIMs and coordinate with JAXA to obtain concurrence **Status:** 06/18/12 - Reviewed updated draft document with JAXA rep. Signature parties identified per O'Toole's e-mail Friday 6/15/2012.. 07/27/12 - FLEX-2J is still in work by the PI. Latest JAXA comments have been incorporated into the SRD. 09/12/12 - GRC Science, JAXA Science, as well as GRC Project management & Zin Engineering have all signed off on SRD. Awaiting for NASA HQ to sign off and approve. **ECD:** 09/28/2012
MDCA-014 ➡ Technical O'Toole	ICE-GA combustion by-products	Given that the hexanol combustion by-products are not established there is the possibility that the ICE-GA hexanol fuel may not be allowed on ISS.	1	3	**Mitigate:** The project intends to perform by-product testing on hexanol to show it is compatible with ISS vents requirements and meets toxicity limits. **Status:** 09/12/12 - Test has been initiated. **ECD:** 10/31/2012

Risk Matrix - FCF

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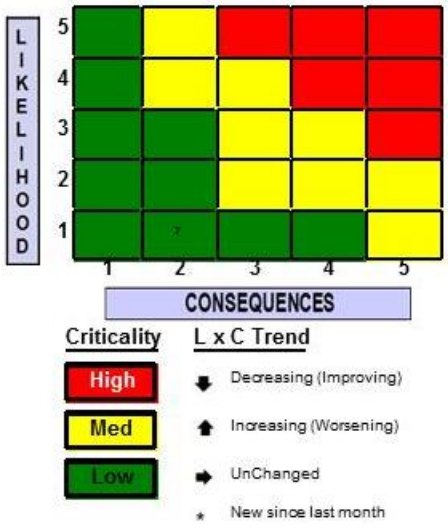
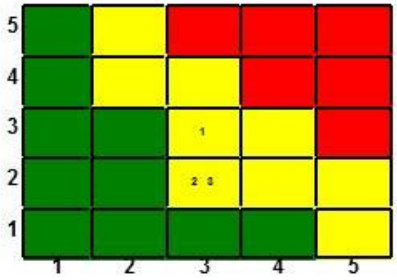


Risk Id	Risk Title	Risk Statement	L	C	Approach
MDCA-015 ➡ Schedule OToole	Unapproved ICE-GA Science Requirements Document	Given that the ICE-GA SRD is not signed at PDR there is a risk that project cost and schedule will not be met.	1	2	**Mitigate:** Get the SRD signed by both Italians and Project. **Status:** **ECD:** 09/28/2012

Risk Matrix - FCF

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



Criticality

- High
- Med
- Low

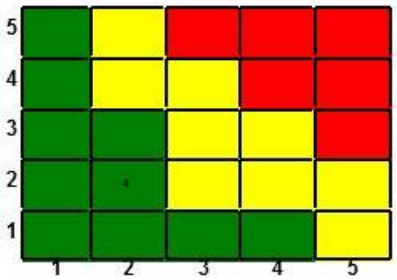
L x C Trend

- Decreasing (Improving)
- Increasing (Worsening)
- UnChanged
- New since last month

Risk Id	Risk Title	Risk Statement	L	C	Approach
TSC-004 Cost	Lack of support depth	Given that there is no more than 1 subject matter expert in the areas of TSC System administration, FCF Ground software, and FCF data post-processing, there is a risk that FCF will not be supported adequately to ensure mission success.	3	3	Status: ECD: 12/28/2012
TSC-002 Technical	DICES III voice loop system obsolete	Given that DICES III system hardware is at end-of-life, there is a risk that voice loop services will not be available to support mission operations.	2	3	Status: ECD: 12/28/2012
TSC-003 Technical	Video System Difficult to Support	Given that the Grass Valley video matrix and AMX video switch system uses an unmaintainable and undocumented configuration, there is a risk that all video channels may not be available to support mission operations.	2	3	Status: ECD: 12/28/2012

Risk Matrix - FCF

101 Fluids and Combustion Facility, MIP, TSC, LMM, MDCA



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Risk Id	Risk Title	Risk Statement	L	C	Approach
TSC-001 Technical	Stale TSC documentation and not up to date	Given that documentation has not been updated as physical changes are made at the TSC, there is a risk that troubleshooting and maintenance will not be properly performed.	2	2	Status: ECD: 12/28/2012

102 Acceleration Measurement Program (AMP)

Engineering Lead Jennifer Keller & Ray Pavlik

NASA Program Manager: Tom St. Onge
NASA Project Lead: Kevin McPherson / Bob Hawersaat

SAMS Objective:
- Provide acceleration measurement systems that meet the requirements of the researchers on board the International Space Station.
- SAMS measures the acceleration environment in the 0.01 to 400 Hz range for payloads.

MAMS Objective:
- Provide acceleration measurement system that measures the Quasi steady and vibratory acceleration data in the 0.00001 to 100 Hz frequency range on board the International Space Station (ISS) vehicle

PIMS Objective:
- Provide acceleration measurement data to Principal investigators who conduct scientific research on board the International Space Station.
- The SAMS acceleration measurement system provides the raw data that PIMS uses to provide analysis to the Principal Investigators. SAMS measures the acceleration environment in the 0.01 to 400 Hz range for payloads.

Milestone Schedule

102 AMP (SAMS, MAMS, PIMS)

WBS	Milestone	Start	Baseline	Projected	Actual	Schedule Variance
1.8.9	SE Cable – at least 144 inches in length	7/12		12/12	1/13	Delivered for ATV4 launch
1.8.10	Spare TSH-ES	7/12		12/12	1/13	Delivered S/N 03 for ATV4 launch
1.8.10	TSH-ES 08	1/13		12/13		

Issues and Concerns

102 AMP (SAMS, MAMS, PIMS)

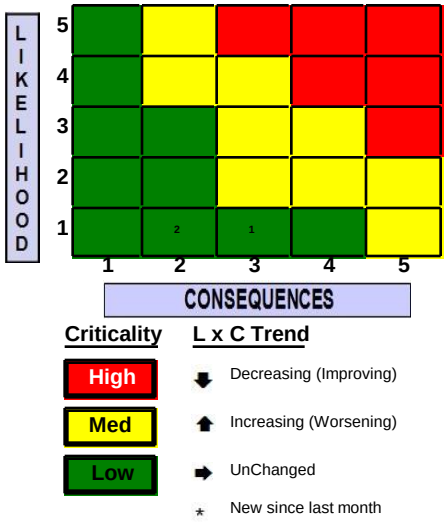
Issue	Potential Impact	Action Plan	Resolution Date
Network issues onboard delaying EE-F05 boot process	EE-F05 not booting	Work with DMC to help determine network issues.	Moved sensor back to EE-F05 and the network troubles have not appeared as of late. Continue to work with Express if/when it does occur.
Crew office cannot properly torque the SAMS MSG baseplate into the MSG WV	Not a good surface mount for the SAMS TSH-ES	1. ECO the SAMS AIDD to call out the torque values for the baseplate 2. Request in writing the issue and why it cannot be performed.	9/15/09 – telecon held with MSG. It was decided that the fasteners on the SAMS baseplate for the TSH-ES will not be torqued. Integrated Safety Hazards are being updated on the MSG side, and SAMS is clarifying a SAMS safety hazard. TSH installed in MSG and working with SODI. Crew procedures said to be hand tight.
TSH-ES S/N 08 failed the failed the SAMS TSH-ES Functional Acceptance Test	TSH-ES S/N 08 will not fly on ATV-4	1. Work the NCR SAMS-NCR-271	April 2013
Rack to rack network issues preventing SAMS booting EE in JEM.	No acceleration data can be collected in the JEM.	1. Supporting MSFC and JSC in the troubleshooting efforts.	Unknown

Monthly Highlights
102 AMP (SAMS, MAMS, PIMS)

- Software Upgrade Status
  - EE is booting
- TSH-ES 08 troubleshooting plan generated for NCR-271
- Operations
  - Supporting MSFC and JSC to troubleshoot the rack to rack communication issues preventing the SAMS EE in the JEM to communicate with the ICU in the US Lab.
  - Supporting all data requests (JAXA, loads & dynamics, CSLM, etc.)

Acceleration Meas Proj (SAMS MAMS PIMS)

Task Level Risk Assessment



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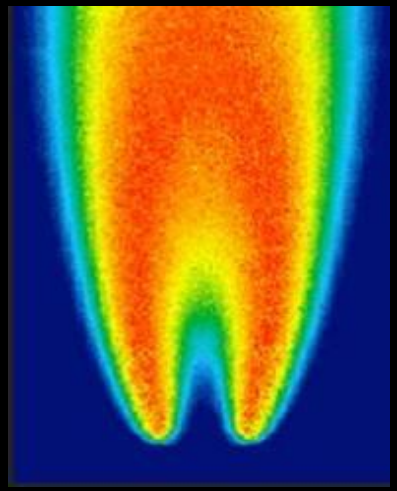
Risk Id	Risk Title	Risk Statement	L	C	Approach
AMP-001 ➡ Technical Keller	SAMS Sparing	Given that SAMS PCS hardware is not supported by the ISS program then there is the possibility that limited spares will become depleted and SAMS will not be operational on the ISS	1	3	**Mitigate:** SAMS Control Unit upgrade plan has been approved and is the implementation process. When complete, the spare pool will be vastly increased to include PCS/ISS laptop hardware available on the ISS. **Status:** **ECD:** 01/01/2014
AMP-002 ➡ Technical Keller	SAMS Fan Regulator	Given that the SAMS RTS Drawer #2 fan regulator frequency varies, there is a possibility that the fan regulator could fail.	1	2	**Watch:** SAMS data allows tracking of the fan frequency signature continuously. Should a fan regulator failure occur, the spare fan unit will be installed. **Status:** **ECD:** 01/01/2015

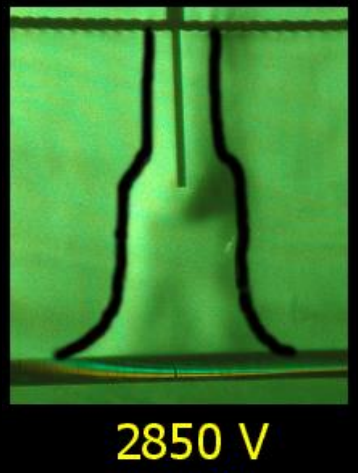
110 Advanced Combustion via Microgravity Experiments (ACME)

s-Flame
(drop test)

Flame Design
(drop test)



CLD Flame
(aircraft test)



E-FIELD Flames
(1g schlieren)

Manager: Brian Borowski

NASA Program Manager: Tom St. Onge
NASA Project Lead: Mark Hickman
NASA Project Scientist: Dennis Stocker

SpaceDOC 110 encompasses the initial development phase of ACME including requirements and verification development and planning, flow system breadboard interface with existing FOMA breadboard and color camera trade studies to ultimately provide a new diagnostic capability for CIR. Work on Engineering Model design is included following completion of Preliminary Design Review in January of 2011.

Issues and Concerns

110 Advanced Combustion via Microgravity Experiments

Issues	Potential Impact	Action Plan	Resolution Date
There are some requests to the project from the Project Scientist to change Science Requirements	If these changes are approved the ACME budget and schedule will be impacted. The longer the decision process takes, the more severe the impact will be as the flight design continues moving forward	A review panel was convened by NASA Project Management to discuss the potential changes. Actions were distributed to help make a determination	?
Following functional testing of the E-Field Subsystem and EMI testing of the same subsystem some requirement compliance issues have arisen with regard to energy levels	Unable to meet science requirements	Review Board has been convened to further discuss and provide guidance to management	12/12
Still have not received requirements for BRE, due January 30, 2013	Will miss deliverable date of 1/2013	Project Scientist has provided preliminary changes to ISRD, mostly based on BRE	?

Monthly ACME Highlights

- Continued build of EM Avionics Package
- Continued build of Flight Avionics Package
- Build of an EM Radiometer Assembly continues
- Build of EM Zoom Lens Assembly is complete
- Redesign of igniter sub-system and mass flow controller assemblies is complete.

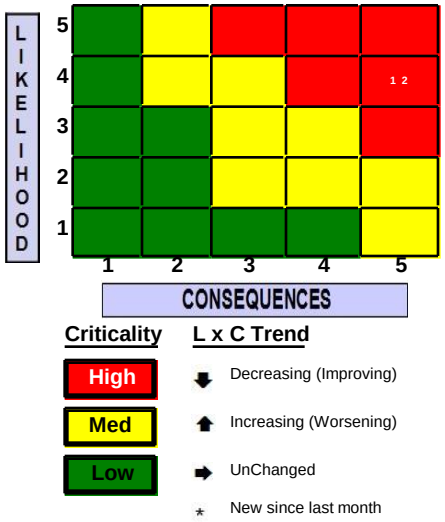
Milestone Schedule

110 Advanced Combustion via Microgravity Experiments

WBS	Milestone FY12	Credit	Start	Baselined	Projected	Actual	Scheduled Variance
1.3	Phase 2 FSR SDP	0% Complete	December 2013	December 2013	December 2013		0
1.1	CDR Presentation Package	0% Complete	November 2013	November 2013	October 2013		-1 month
1.2	Updated Science Compliance Matrix for BRE	0% Complete	January 2013	February 2013	April 2013		+2 month

ACME

Task Level Risk Assessment



Criticality

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L x C Trend

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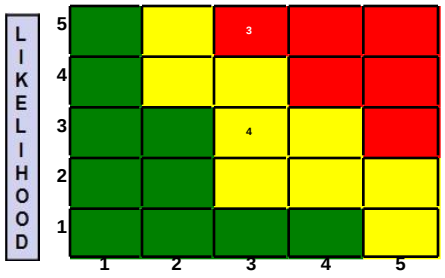
- UnChanged
- * New since last month

Risk Id	Risk Title	Risk Statement	L	C	Approach
ACME-024 ➡ Cost Medved	ACME software could be re-classified as safety critical software	Given that NASA is reviewing all software to determine if it should be designated safety critical software; then there is the chance that ACME software will be designated as safety critical software and significant costs and schedule delays will occur.	4	5	**Watch:** Wait for the GRC group that met the week of 1/14/2013 to provide a consensus as to the approach for dealing with safety critical software. **Status:** 02/19/13 - Still waiting for the GRC group and their recomendations. **ECD:** 11/01/2013
ACME-022 ⬆ Technical Mroczka	BRE science requirements	Given that there is not an updated SRD for BRE; there is a risk that the design for BRE will be deficient at the PDR milestone.	4	5	**Mitigate:** Project scientist to write the SRD. **Status:** 02/19/13 - RDR/PDR for BRE is scheduled for June 2013. 02/19/13 - ACME NASA Project Scientist to have a hardware requirements update to the SRD for tentatively 3/5/2013. **ECD:** 02/19/2013

ACME

Task Level Risk Assessment



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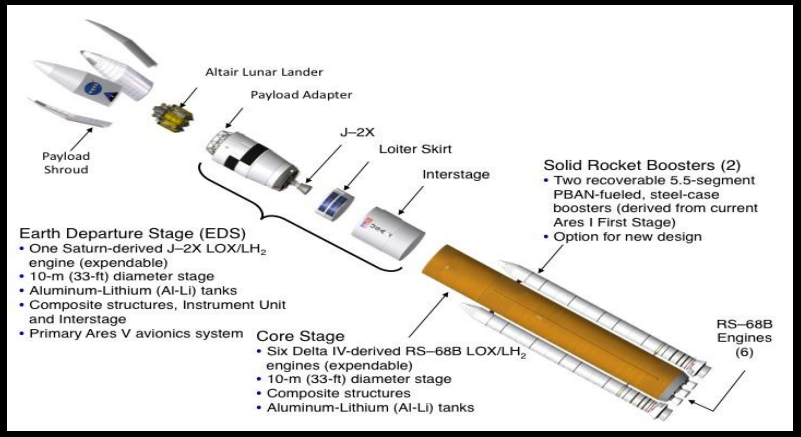
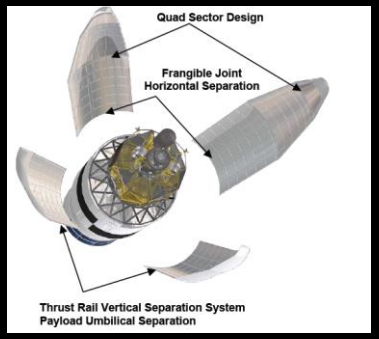
Risk Id	Risk Title	Risk Statement	L	C	Approach
ACME-014 Technical Rogers	IPSU to IOP image transfer rates take too long	Given that the current data transfer rates from the IPSU to the IOP is severely limited, transfer of ACME data may take an unacceptable amount of time and may reduce obtainable science for the allotted operational time on board ISS.	5	3	**Watch:** Need to keep an eye on this and follow up with the CIR team to keep updated on transfer improvements. **Status:** 12/13/11 - The FCF team has improved transfer rates by utilizing both IOP hard drives. The FCF team needs to provide quantitative data transfer rates. 03/27/12 - Risk reviewed by the ACME team and no staus updates at this time. 05/08/12 - ACME RMWG has reviewed this risk and there are no updates at this time. 06/12/12 - Risk was reviewed at the monthly ACME RMWG and there are no updates at this time. 07/27/12 - Negotiations to fund an IPSU upgrade with increased data transfer rates has been intiated. 09/12/12 - Currently the IPSU to IOP transfer rate is approx 1.3 Mbps. The IPSU redesign concept calls for a direct downlink from the IPSU directly to ground with ISS downlink capability at 20Mbps. FCF project is submitting a funding request to support development of the concept. 09/18/12 - ACME needs a minimum of 10 Mbps. 10/16/12 - This was reviewed in the monthly RMWG with nothing new to report. 11/20/12 - The FCF NASA PM has obtained funding for a new IPSU design with the ACME data transfer rates as part of the design criteria. 02/19/13 - Risk reviewed and there are no updates at this time. **ECD:** 11/28/2013
ACME-023 Management Hickman	TFP requirement change	Given that new TFP science requirements are added to the ACME SRD; then there is the chance that the ACME project schedule and budget will not be met.	3	3	**Mitigate:** The engineering team to provide the cost and schedule to NASA ACME PM. The Science team to provide justification for the changes in science requirements. **Status:** **ECD:** 03/29/2013

119 Ares V Payload Shroud Element (PSE) Project

ZIN Manager: **Michael Johanson**
ZIN Engineering Lead: Bill Dial

NASA Project Manager: Gerry Sadler





SpaceDOC 119 encompasses evaluation of potential manufacturing approaches focusing on the Heavy Lift Payload Shroud but not be limited to (e.g. can include other element composite dry structures). Approaches may include: existing composite manufacturing sites, MAF, and new sites. ZIN and our subcontractor Zero Point will identify needed composite manufacturing assets and capabilities to support current Heavy Lift Vehicle concept and associated requirements based on manufacturing assessments done by the NASA ESMD ACT project. The scope of the analysis shall include logistics and supply chain requirements.

Issues and Concerns

119 Ares V Payload Shroud Element (PSE) Project

Issue	Potential Impact	Action Plan	Resolution Date
None			

Monthly PSE Highlights

- Continued to work Shroud Structural Analysis and Design task.
- A no cost extension was requested to extend the POP to 5/04/2013.

NASA GRC SpaceDOC

Milestone Schedule
119 Ares V Payload Shroud Element (PSE) Project

Milestone (Cal 10)	Baseline (Cal 10)	Projected	Actual	Schedule Variance
Payload Shroud Technology Development Plan	November 30, 2010	Nov 30, 2010	Nov 30, 2010	None
Preliminary Element Integration Assessment Report	January 15, 2011	Jan 15, 2011	Jan15, 2011	None
Manufacturing Implementation Plan	February 15, 2011	Feb 15, 2011	Feb 15, 2011	None
Final Element Integration Assessment Report	March 25, 2011	April 25, 2011	April 25, 2011	1 month no cost extension approved by Gerry Sadler
Provide a Basis of Estimate Bottoms Up Assessment of the Current SLS Shroud for metallic and composite 8.4 meter baselines.	June 6, 2011	June 6, 2011	June 6, 2011	None
Assessment of CPS Impacts on Payload Shroud	September 30, 2011	Sept 30, 2011	Oct. 13, 2011	Delivery slipped based on stop work due to lack of funding, slip was approved by Gerry Sadler
Fairing Basis of Estimate Updates 1. PPBE13 Update 2. Initial PPBE14 Update 3. Final PPBE14 Update	1. Oct. 30, 2011 2. May 30, 2012 3. Sep 30, 2012	1. Oct. 30, 2011 2. May 30, 2012 3. Sep 30, 2012	Dec. 12, 2012	The PPBE schedule is determined by NASA and the dates of the deliverables are subject to change.
Analysis and Design Reports 1. SRR 2. SDR	1. Oct. 1, 2011 2. Feb 1, 2012	1. Feb 1, 2012 2. Feb 1, 2012	Oct. 4, 2012	SLS SRR & SDR are NASA determined dates. They are currently planned to be combined and held Feb. 15, 2012.
Payload Fairing Evaluation: Test Plans and Procedures	15 day prior to testing		N/A	Work is de-scoped
Delta IV Stage Integration Assessment	Jan 31, 2012	Jan. 31, 2012	N/A	Work is de-scoped

Risk Matrix - PSE

119 Ares V Payload Shroud Element (PSE) Project

Study Delivery Order – No risks

NASA GRC SpaceDOC

DO-128 Communications, Navigation, and Networking Reconfigurable Testbed (CoNNeCT-2)

ZIN Project Lead: Ray Pavlik
ZIN Software Lead: Jennifer Keller

NASA Project Manager: Diane Malarik
NASA Deputy Project Manager: Mike Zernic
NASA GRC PI: Rich Reinhart
NASA GRC Deputy PI: Sandy Johnson

- An on-orbit, adaptable, Software Defined Radios (SDR)/Space Telecommunications Radio System (STRS)-based testbed facility to conduct a suite of experiments to advance technologies, reduce risk, and enable future mission capabilities on the International Space Station (ISS).
- DO-128 Scope of Work includes:
  - Performing configuration management activities, including software.
  - Remaining development of the CoNNeCT Flight and Ground System Software.
  - Integration with the Payload Operations Integration Center (POIC) and SCaN-provided SN, NEN, and NISN.
  - Sustaining Engineering and Operations of the Flight and Ground System.
  - Experiment Integration and Operation

DO-128 Issues and Concerns

Issue	Potential Impact	Action Plan	Resolution Date
None			

DO-128 Monthly Highlights

- Subtask A CM/DM
  - Reviewed, formatted, and released multiple Documents, Process Plans, Change Requests, and NCRs.
  - Supported GIU drawing updates.
  - Processed for storage as-run Mission Operations Procedures and GIU documents.
  - Generated another final build & release of the first post ship software release. This includes the JPL Heartbeat change and other changes identified during SW V&V.
  - Reviewing and update the Software CM Plan, including a new SCR form and workflow, and review board process.
- Subtask B SE&I, Software, and Experiment Integration
  - GIU Maintenance (GRC-CONN-PLAN-0895)
    - Downloaded Avionics Files on a weekly basis.
    - Installed new Symantec Virus Definition Files on the GIU TReK Workstation, GIU GSE Terminal, GIU Laptop, ELC SCS #2 and ran a full virus scan.
  - GIU TWTA Pre Amplifier
    - Drawings are in approval cycle.
    - Process Plans for assembly and installation have been developed.
  - A test set and cable interface were assembled to remove the EFEP from the mission operations ground system for testing just the SFEP(s).
  - Monitored new NTP client in use with GIU ground systems. Log files show that the systems are being maintained to within 0.01 seconds of the GPS master clock on a 15 minute refresh cycle interval.

DO-128 Monthly Highlights

- Subtask B SE&I, Software, and Experiment Integration (continued)
  - Started dialogue with Agilent for this year on-site calibrations. We are attentively scheduled the week of May 20th and all team members have been advised. The equipment list is being completed and will be sent to Agilent for a cost quote.
  - Commissioning Testing at WSC
    - Supported Phase 1 Commissioning at WSC.
    - The commissioning and testing were completed, the equipment packed up and shipped back to GRC. The equipment has returned, been unpacked and returned to its normal work location.
  - Supported testing of JPL Breadboard SDR with a Software Development System to obtain data for use in debugging a CTADS command response issue which was seen during early JPL GPS experiment testing on the GIU.
  - Experiment 4 JPL GPS
    - Prepared a NPR 7150.2A compliance assessment. Reviewed the compliance assessment with NASA GRC SQA and the SCaN Testbed SE&I Lead. Obtained concurrence on document and forwarded to JPL for review.
    - Prepared a draft script plan 4. Met with STB Mission Operations to initiate development of draft flight procedures.
    - Iterated the overall integration schedule for Experiment 4 with the experimenter. Met with project scheduler to integrate experiment schedule into overall project schedule.
  - JPL Ground Beacon (Mini-EP)
    - Initiated integration activities for a special capability test requested by JPL for S-band receive tests of a JPL ground beacon (Mini-EP).
    - Prepared a draft operations requirement matrix for Mini-EP. Reviewed with the experimenter and then submitted to SCaN Testbed Mission Operations.
    - Prepared draft flight procedures for Mini-EP based on iteration from existing JPL S-band capture procedures.

DO-128 Monthly Highlights

- Subtask B SE&I, Software, and Experiment Integration (continued)
  - Ground Software
    - Worked on CRs for CTADS and CESDB updates including JPL Heartbeat screens.
  - Flight Software
    - Created and revised workflows for Redmine SW projects/sub-projects.
    - Continued with SW V&V of PAS Post Ship Release #1. Implemented changes to correct errors discovered during testing resulting in a new PAS release.
    - Wrote draft of Mission Ops PAS installation procedure.

- Subtask C Flight & Ground Software
  - As of FY2013, flight and ground software activities have transitioned to WBS 01-03.

DO-128 Monthly Highlights

- Subtask D Mission Operations
  - Completed the TCR inputs and submitted to PTG (ISS pointing).
  - Completed the TRK and XML configuration file inputs for the operational weeks.
  - Completed PFD (power flux density) class analysis for the operational weeks.
  - Prepared weekly PPM inputs and the weekly POIC Briefing. Worked with PPM, Prep-OC, and TCO to add SCAN Testbed activities to timeline and make adjustments based on the granted SN/NEN events.
  - Prepared the scripts and procedures necessary for the operational weeks.
  - Attended the Experimenter's telecon and provided support to SE&I
  - Training is in progress for two new Ops members. They will be learning the SN/NEN scheduling and SFEP operations.
  - A CR to update GRC-CONN-OPS-0912 Mission Operations Modules was submitted. The CR includes changes from the SDR commissioning.
  - Continued with SFEP troubleshooting. GSFC prepared a new module that allows the buffers to be adjusted during real-time. A Fireberd was added to the configuration in place of the EFEP for loopback testing.
  - The issue with the Harris and JPL forward link has been isolated to the low rate switch (JPL Port 277) at WSC. The current configuration does not allow multi-SDR operations. A new port cannot be assigned to SCaN at this time due to a freeze mandated during TDRS K activities. The new port requires HDW and SW changes at WSC.
  - Completed SDR Commissioning during Week 19, 20, and 21.
  - Performed TDRS-K tests during SDR Commissioning to prepare for commissioning.

DO-128 Monthly Highlights

- Subtask D Mission Operations (continued)
  - Members of the Ops team attended the Expt #3 Networking Experiment Readiness Review and a briefing by Jim Lux of JPL about using the LGA-NEN antenna to receive a signal from a JPL ground antenna.
  - Completed initial LGA-NEN access analysis from ISS to the JPL facility for the above experiment time
  - Working with the software team on the sequencing of the planned upload and the requisite procedures.
  - Completed the PFD effective power wizard. The wizard is embedded in the PFD modeling tool in LynxCAT SK Toolbox and allows the user to rapidly predict the effective power based on the selection of antenna, modulation, data rate, spreading and application of CW.
  - Completed the PFD analysis description TTR presentation. This presentation presents a detailed description of the current PFD modeling process and compares the revised solution method to the more conservative Space Network User's Guide (SNUG) defined approach. This analysis workup is preparatory to modifying the PFD flight rule.
  - Continued making development changes to the LynxCAT SK Toolbox. The articulation of the PV arrays was completed and verified against previous obscuration times; time match to within ~20 seconds. Other small changes have been implemented to support the upcoming SCAN Orbital Mechanics course
  - SCAN Orbital Mechanics: Completed the development of the first of a three part orbital mechanics class for SCAN TB. Part I will be presented on 3/1/13 and will feature a basic overview of orbital mechanics and is preparatory to Parts I and II.
  - Completed the analysis of the TDE AT walk off during event 2013 GMT 036 16:36:10. The delogs were analyzed to compute the effective TDRS pointing error based on the an open loop prediction. The first AT walk-off correlates with the APQM response and is similar to the previous event. However the subsequent recovery response is more confusing and difficult to discern the dynamics that were occurring at the TDRS AT. This data was added to Redmine and includes an email follow up with David Cunniff.

DO-128 Monthly Highlights

- Subtask D Mission Operations (continued)
  - Completed the install of the new production T3600 TReK workstation. This TReK replaced the old TReK33 that is now a standby workstation for the production workstations.
  - Updated the EHS & EPC software on all TReK workstations for COFR. Removed old EHS file directories. Conducted COFR for increment 35.

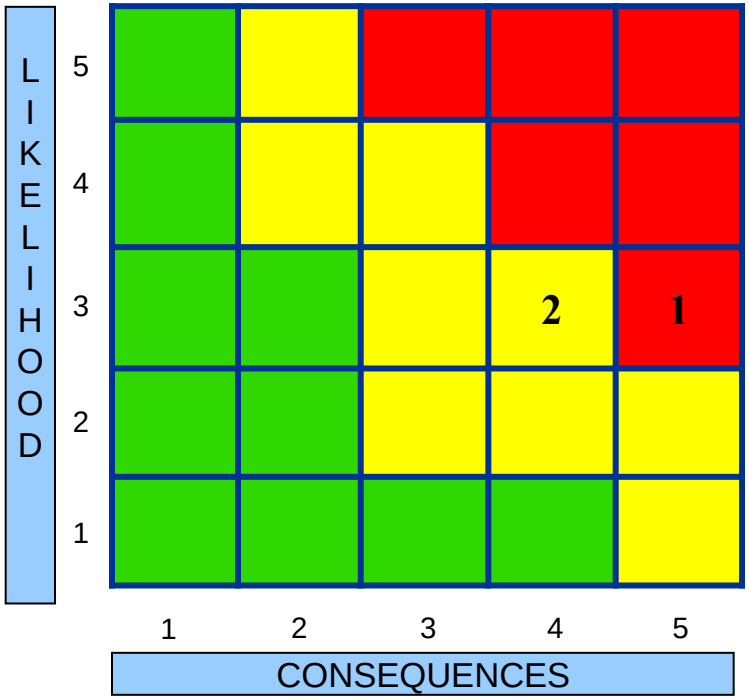
DO-128 2012 Deliverables List

Hardware/Software Deliverables CY 2013

No.	Item Description	Planned Completion Date	Actual Completion Date	Note
a)	Subtask A –CM/DM: Configuration Management and Tracking System (CMTS)	December 31, 2013		Hardware
b)	Subtask B – SE&I: First Verified Post-Ship Flight Software and subsequent upload to the Flight System	April 30,2013		Software
c)	Subtask B – SE&I: Verified Ground Software, suitable for use with First Post-Ship Flight Software	April 30,2013		Software
d)	Subtask B – SE&I: Second Verified Post-Ship Flight Software and subsequent upload to the Flight System	August 30, 2013		Software
e)	Subtask B – SE&I: Third Verified Post-Ship Flight Software and subsequent upload to the Flight System	November 30, 2013		Software
f)	Radio Frequency and Electronic Hardware Assemblies	December 31, 2013		Hardware

DO-128 Risk Matrix Overview

STATUS AS OF: 02/23/13



LxC Trend	Rank	Approach	Risk Title
➔	1	M	Underfunded Operations and Experiments Phase
➔	2	M	Experimenter Software Interface

Criticality

High

Med

Low

L x C Trend

- ↓ Decreasing (Improving)
- ↑ Increasing (Worsening)
- ➔ Unchanged
- N New

Approach

- M – Mitigate
- W – Watch
- A – Accept
- R – Research
- C – Closed